RECRUITMENT, RETENTION, AND TRAINING IN RESTORATION ECOLOGY

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SUMMARY: This project seeks to improve recruitment, training, and retention of students from underrepresented groups for careers in restoration ecology and vegetation management in the region surrounding San Bernardino, California. The project increases the capacity of California State University, San Bernardino (CSUSB) to provide training in restoration ecology and related biological sciences, boosts student success in attaining a Bachelor of Science degree, and provides opportunities for students at CSUSB and two nearby Hispanic-serving community colleges (Victor Valley College and Chaffey College) to work on projects with the Forest Service, the Rancho Santa Ana Botanic Garden, and researchers at University of California, Riverside, that expose them to careers and doctoral research in restoration ecology. The project funds the establishment of a restoration research site for student use on the CSUSB campus, using it in a modified, required course in the biology major that serves sixty to seventy students yearly. It funds development of workshops for 100 beginning biology students, which are designed to broaden their horizons to include potential careers in USDA-related fields and improve academic success. It also funds assistantships and internships for thirty-two students in restoration. **This project addresses Educational Need areas e (student experiential learning), f (recruitment and retention), a (reshaping curricula), and b (preparing faculty), to serve Priority Need Area 2 (preparing underrepresented groups for USDA-related careers) and further USDAs Strategic Goal 6, to protect and enhance the nations natural resource base and environment.** This project should increase the number and diversity of students interested in restoration-related careers and improve their academic success.

OBJECTIVES: There are three overarching objectives for this project: (a) to improve training of biology students at CSUSB in applied ecological fields, increasing the knowledge and skills they have to pursue careers and higher degrees in fields related to ecological restoration and to solving problems posed by invasive species, (b) to increase recruitment and retention of students from underrepresented groups in the region in fields related to applied ecology (restoration ecology, weed science, and conservation biology), and (c) to boost students success in completing a college degree. Increased understanding among advanced biology majors of the practical applications of ecology should be reflected in improved quality of answers to questions targeting appropriate applied content knowledge in a required ecology class in the biology major. Increased recruitment and retention of students from underrepresented groups in fields related to restoration ecology should be reflected in a higher number of underrepresented students applying for internships with the Forest Service. Lastly, this grant will positively impact student academic success through improved performance (higher grades and more rapid progress through a degree program) for students that participated in the orientation workshops. Certain products funded by this grant (e.g., the development of an orientation workshop and the establishment of a restoration research site on the CSUSB campus) should benefit students and continue to contribute to the grants objectives long after the grant expires.

APPROACH: To improve training of students at CSUSB in applied ecological fields such as restoration ecology, staff will increase the applied content of a required ecology course in the biology major and establish restoration research plots on campus for use by this class and student researchers. Modification of BIOL 450 (Introduction to Ecology) to use these plots (Figure 1) and boost the applied content of the course will entail substituting a lab that previously compared vegetation on different slopes with one that compares vegetation development in different restoration plots to a reference system as well as increase the readings in applied ecological topics, such as impacts of invasive species, impacts of pest and disease introductions, and impacts of exposure to various pollutants. These changes will necessitate the development of a database to which successive classes will contribute data. Since students will now be observing trajectories of vegetation change over time in restoration plots, they will need access to data from previous years. This database will serve this class for decades after the end of this grant and could be placed online for use by classes from other institutions. To improve recruitment and retention of students from the region, the project staff will design and offer a two-day orientation for students entering the lower-division core biology sequence at CSUSB. This workshop will be aimed at improving student success and broadening students career goals to include USDA-relevant careers. Speakers from USDA-related fields will be invited to speak to students throughout the year at CSUSB and internships at the Rancho Santa Ana Botanic Garden will be tailored to serve more effectively as a recruitment tool for internships with the San Bernardino National Forest by incorporating field experience on the nearby national forest. Restoration internships with the San Bernardino National Forest will be developed to build on propagation, plant survey, and seed treatment skills acquired through internships with the Santa Ana Botanic Garden. Opportunities for undergraduates to explore interests in pursuing doctoral programs will also be offered by providing research experiences for undergraduates in restoration ecology at the University of California Riverside. The orientation workshop developed under this grant will also serve the third objective: to boost student success in completing a college degree. It will include activities designed to improve academic success, such as hands-on practice in study skills, testing of skills and prior knowledge, and interactions between incoming students and advanced Master of Science students. Student success and the potential for higher degrees will be highlighted through these activities. This workshop will be structured to foster interactions among incoming students and encourage the type of ongoing cohort interactions that frequently contribute to student success. Fifty student applicants to each workshop will be selected for the trial runs to be offered under this grant.

Pre-disturbance habitat on the CSUSB campus in 2003

Post-disturbance habitat on the CSUSB campus in 2008

Figure 1. 'Before' and 'after' photos of the site where experimental re-vegetation plots will be established. Students in the introductory CSUSB Ecology class (Biol 450) will collect data contributing to a long-term ecosystem restoration database for these plots.